

I. Amendments to the Specification

Please replace the specification with the following. A clean version of the amended specification is enclosed as Attachment A.

**ELECTRICALLY INSULATED FASTENING
ARRANGEMENT FOR AN AIRBAG MODULE**

~~Description~~

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to PCT/EP03/05340, filed May 22, 2003, and DE 102 24 633.0, filed June 7, 2002.

BACKGROUND OF THE INVENTION

[0002] The invention relates to a fastening arrangement for an airbag module in motor vehicles, wherein the gas generator of the airbag module is fastened by means of at least one stay bolt and a nut screwed thereupon, the bolt being designed for the gas generator and penetrating through at least one hole of a retaining member that serves for mounting the airbag module and fastening to a vehicle part.

[0003] This general type of fastening arrangement is described in US 5 803 486 A for an airbag module fastened to a car seat, wherein stay bolts, which pierce the wall of a post as member of the seat structure and are fastened thereto by nuts screwed upon them, are attached to the gas generator housing. To the extent that, in In this application in the car seat seats, still other electrically operated and

controlled components, like retractor, seatbelt tensioner and the like, are arranged often provided and preferably fastened to the integrated seat structure, the structure. The problem can appear in the known fastening arrangement arrangements for an airbag module, that sufficiently strong spurious electrical currents can flow to the gas generator and to its ignition mechanism across the seat structure and the stay bolts of the gas generator fastened thereon so that giving rise to the possibility of a spurious release of gas from the gas generator cannot be excluded with the required certainty. Since these types of spurious releases at ill times can have severe consequences for the vehicle occupants are undesirable, it is the objective of the invention to so design provide a fastening arrangement of the aforementioned art type that spurious release is prevented.

[0004] The solution of this objective, including advantageous embodiments and developments of the invention, is achieved by the content of the claims, in accordance with which follow this description this invention.

[0005] In its basic idea, the invention provides that an electrical insulation be is provided between gas generator and a vehicle part. In an advantageous manner, it is thereby precluded that arising electrical currents can reach are insulated from reaching the gas generator and its ignition mechanism across the fastening arrangement. Here the electrical insulation provided forms a line trap.

SUMMARY OF THE INVENTION

[0006] In a first embodiment, the invention for designing fastening system includes the electrical insulation provides that in the form of a shell, which is made of an electrically insulating material and engages the a hole of the retaining member

with at least one shoulder and forms an insulation between the stay bolt and the hole edge of the retaining member, member which surrounds the stay bolt, bolt. The shell is arranged extending at least across the contact area between gas generator and retaining member, and that a member. A bushing also made of an electrically insulating material is arranged on the retaining member between the nut screwed on the stay bolt and the bearing surface of the nut. If the shell insulating the contact surface between generator and retaining member reaches through the hole of the retaining member with a shoulder, then the stay bolt is also insulated from the retaining member in an advantageous manner. The insulation of the nut from the retaining member takes place is further enhanced through the bushing inserted therebetween.

[0007] For this, it is additionally provided according to one exemplary embodiment, embodiment that the shoulder of the shell demonstrates includes a hook-like radial projection lying on the external side of the retaining member facing away from the gas generator. Preferably it is also provided that the shoulder of the shell having the hook-like projection is designed resilient and locks with the vehicle part when pushed through the hole of the retaining member. Easier assembly is associated with this type of solution.

[0008] According to one exemplary embodiment, the invention provides that the radial projection of the shoulder forms a support for the bushing. Alternatively, it may be provided that the bushing engages the projection externally and that its edge lies fully on the retaining member, wherein the inner surface of the bushing engages the projection and the outer surface of the projection may be designed as slanted surfaces that correspond to each other.

[0009] An appropriate plastic is preferably used as electrical insulation.

[0010] To the extent that it is possible for an electrical charge to appear develop on the airbag module and no longer be able to automatically discharge itself against the conducting vehicle part because of insulation undertaken the insulating connection according to invention, it is provided according to one exemplary embodiment of the invention, that a compound-impregnated cable connects the stay bolt to an electrically conducting vehicle part, so that a static charge in the vicinity of the airbag module is likewise excluded dissipated.

[0011] According to one exemplary embodiment of the invention, it is provided that the retaining member serving to fasten the airbag module is fastened to the structure of a car seat. The invention is nevertheless equally applicable to installation situations of airbag modules in which the airbag modules having the integrated retaining member are fastened outside the car seat elsewhere, such as to electrically conducting vehicle parts in the vicinity of the instrument panel. Moreover, the invention is not necessarily restricted to the inclusion of a retaining member, but it may rather also be provided that the stay bolts of the gas generator or generator housing are guided directly through holes provided in a vehicle part serving for fastening the airbag module, and that the fastening occurs by means of nuts screwed onto the stay bolts; as is described in the principle in US 5 803 486 A, which forms the prior art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The drawing depicts an exemplary embodiment of the invention, which is described below. The drawing shows:

[0013] Fig. 1 is a sectional view of an airbag module having a retaining member,

[0014] Fig. 2 shows the connection of gas generator and retaining member in an exploded cutout representation.

DETAILED DESCRIPTION OF THE INVENTION

[0015] The airbag module 10 depicted in Fig. 1 demonstrates has two outer housing halves 11, 11a and 11b which are placed and held together by a hinged connection 14 on their one end and a snap connection 12 at their opposite end. One of the two housing Housing halves 11 half 11b is provided with a predetermined breaking point 13, which is destroyed torn open by the inflation pressure of the gas bag airbag 16 arranged in the airbag module 10, so that one of the housing halves 11 half 11b opens itself pivoting around the hinged connection 14.

[0016] A gas generator 15 and a folded gas bag airbag 16 are arranged in the interior of the airbag module 10. The gas generator 15 is fastened by a stay bolt 18, which is arranged thereon and pierces a retaining member 17 extending into the inside of the airbag module 10, owing to a 10. A nut 22, which screws onto the respective stay bolt 18 threads onto stay bolt 18 to fix the gas generator 15 to the retaining member 17. The retaining member 17 extends beyond the airbag module 10 and features both includes a mounting hook 20 and a mounting hole 21 at its end, so that the retaining member 17 fastens may be fastened to a vehicle part, for example to a section of the seat structure as presented in US 5 803 486 A, which forms the prior art, by means of a suitable fastener fixing agent.

[0017] In order to prevent an electrically conducting connection from the vehicle part or possibly a seat structure to the gas generator 15 and its ignition mechanism ~~across through~~ the retaining member 17 and the fastening arrangement for the gas generator 15, the fastening arrangement consisting is provided with electrical insulation. The fastening arrangement consists of stay bolt 18 and nut 22, and further including a shell 23 made of an electrically insulating material, preferably a suitable plastic, plastic is arranged in the seating area of the gas generator 15 against the retaining member 17 between gas generator 15 and retaining member 17, ~~the 17. The shell likewise 23 insulating the stay bolt 18 and being~~ is supplemented by a bushing 26 arranged between nut 22 and retaining member 17.

[0018] The electrical insulation in the vicinity of the stay-bolt fastening arrangement of this invention is depicted in detail in Fig. 2. Here it is evident that the shell 23, which has a shoulder 24 surrounding the stay bolt 18 and is arranged between retaining member 17 and gas generator 15, 15. The shell shoulder 24 pierces the hole 30 ~~designed~~ in the retaining member 17 and engages the retaining member 17 in a hook-like manner on the side facing away from the gas generator 15 with a radial projection 25 that is directed outwards. This organization ensures that the faces surfaces of the retaining member 17 pointed toward the stay bolt 18 in the vicinity of the hole 30 are also protected and insulated from the stay bolt, so that no electrically conducting connection ~~can arise here between them~~ occurs.

[0019] If a nut 22 is screwed onto the stay bolt 18 for fastening purposes, a bushing 26, which is likewise made of electrically insulating material, is also arranged between the nut 22 and the retaining member 17, 17 so that the nut 22 supports itself on the bushing 26 and a conducting an electrical connection between

the nut 22 and retaining member 17 is prevented. In the embodiment depicted in Fig. 2, the inner surface 28 of the bushing 26, 26 which engages the radial projection 25, and the outer surface 27 of the projection 25, are both designed ~~in the same manner as a slanted surface to have mating slanted surfaces that corresponds to the opposite slanted surface.~~

[0020] The arrangement of shell 23, shoulder 24 and projection 25 is preferably so made, that a locking snap connection results between shell 23 and retaining member 17 during the assembly of the shell 23 to the retaining member 17.

[0021] To prevent electrostatic charging of the gas generator, a compound-impregnated cable 31 connects the stay bolt 18 to an electrically conducting vehicle part, so that the electrical isolation between the vehicle part and/or the retaining member 17 connected thereto and the gas generator 15 is bridged thereby.

[0022] The characteristics of the object of these documents disclosed in the present description, the claims, the abstract and the drawing may be essential for the realization of the invention in its various embodiments both individually and in arbitrary various combinations with each other.

[0023] While the above description constitutes the preferred embodiment of the present invention, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope and fair meaning of the accompanying claims.